

## ABSTRACT OF THE DISCLOSURE

A system for cooling a structure or mechanism through transpiration processes. Generally a porous structural material may be used to form a hot wall surface of a high temperature or high heat flux environment component, typically used in combustion type devices. Coolant pressurized on the "cold" or cooler side of the wall is bled, "sweated", or otherwise transpired to the "hot" wall surface in an effort to control the hot wall surface temperature by shielding the surface with a coolant layer at the surface and by removing heat via coolant flow past the surface. This may be done to manage the hot wall temperature for structural purposes, more effectively manage high heat fluxes, or to hide thermal signatures. The porous material can be selectively made such that the coolant material flows substantially in one direction only through the porous material to transfer thermal energy only away from the structure rather than towards the structure.